SP-T2 Project Effects on Special Status Species

October 25, 2002

1.0 Introduction/Background

The following study plan addresses stakeholder concerns for special status plants and animals associated with the recreation and power generation facilities at Oroville and project releases to the Feather River downstream to the Sacramento River. This investigation will provide 1) information for ESA consultation with the US Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG); 2) information for Federal agencies reviewing of the project under Section 4(e) of the Federal Power Act; and 3) a description of existing conditions for and potential project effects on special status species as required by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The following is an overview of the special status species considered in this investigation.

Numerous special status species may occur within the immediate project vicinity. These species include plants and animals classified as threatened or endangered under the State or Federal Endangered Species acts, U.S. Forest Service (USFS) sensitive species, U. S. Bureau of Land Management (BLM) sensitive species, State and Federal species of concern, Federal migratory non-game birds of management concern, and State fully protected species.

Several State and/or federally "listed" species are known to occur within the Project boundary including southern bald eagle, American peregrine falcon, greater sandhill crane, and valley elderberry longhorn beetle. Other "listed" species are known to occur in the project vicinity including bank swallow, western yellow-billed cuckoo, Swainson's hawk, California red-legged frog, giant garter snake, vernal pool fairy shrimp, Butte County meadowfoam, hairy Orcutt grass, slender Orcutt grass, Greene's tuctoria, Hoover's spurge, Hartweg's golden sunburst, and Layne's ragwort. Potentially suitable habitat may exist within the study area for these species as well as vernal pool tadpole shrimp and Conservancy fairy shrimp.

The following information provides background information on the status, distribution, and habitat requirements for listed species within the Study area. This information was used to guide the study approach for each species.

Bank swallow

The State of California listed the bank swallow as a threatened species during March 1989. Bank swallows historically bred in suitable habitat throughout lowland California (Grinnell and Miller 1944). The bank swallow's range in California has decreased significantly with only four known populations south of San Francisco Bay. Approximately 70 percent of the statewide population currently occurs along the Sacramento and Feather rivers (CDFG 1992). Bank swallows occur in riverine habitat and require a sandy or silty vertical bluff or riverbank for nesting (Zeiner et al. 1990). Floods or very high flows are required to create and maintain the eroded banks favored by this migratory, colonial species. The principal threat to bank swallows are bank protection projects (Remsen 1978).

During a 1987 survey of the Feather River, 18 bank swallow colonies were identified with a total of over 6urrows (Laymon et al. 1988). No colonies are known to occur within the Project boundary (CDFG 2001). However, project-related flood control activities serve to limit the natural flow variability in the Feather River and associated bank erosion.

Greater sandhill crane

Both the lesser and greater subspecies of sandhill crane winter in the Central Valley of California. The greater sandhill crane subspecies is classified as a State threatened species. This species is not federally listed but is considered a sensitive species by Region 5 of USFS.

The greater sandhill crane breeds in North-eastern California and South-central Oregon and winters in California's Central Valley (Littlefield 1982). The California wintering population was estimated at 3,400 to 6,000 individuals in 1988 (CDFG 1992). The California breeding population is believed to be less than 300 pairs. In addition to greater sandhill cranes, approximately 25,000 lesser sandhill cranes migrate to and winter in California's Central Valley (CDFG 1992).

Wintering crane habitat consists of an open expanse of shallow water for communal roosting, rice or corn fields for foraging, and irrigated pasture for loafing (CDFG 1992). No nesting sandhill cranes occur within the study area. Wintering sandhill cranes (unknown sub-species) are frequently observed in the rice/corn growing area west of the Thermalito Afterbay and infrequently in flight over the study area. DFG records indicate that greater sandhill cranes may be present in grassland habitats near the Thermalito Afterbay on rare occasions. However, DFG experts indicate that these occurrences are rare enough that survey efforts are unlikely to detect wintering greater sandhill cranes. DFG staff have requested that DWR assume that rare wintering sandhill crane use may occur and that a desktop study of potential project effects be completed.

American peregrine falcon

The American peregrine falcon was federally listed as an endangered species in 1970 and subsequently listed as endangered by the State of California as well. The USFWS recently delisted peregrine falcons but they remain State listed. The breeding population of peregrine falcons in California has increased from two known active nest locations in 1970 to over 120 nesting pairs in 1999.

Within California, this uncommon breeding resident is found from the southern coast range north to the Oregon border and throughout the Cascade and Sierra Nevada mountain ranges (Zeiner et, al 1990). Peregrine falcons nest on a variety of substrates throughout their range including river cut banks, hollows in large old trees, old raptor nests, bridges, skyscrapers, and cliffs. However, cliffs are the most common nest sites. Suitable cliffs are generally extremely high, frequently overlook water, and permit an expansive view of the surrounding countryside (Hickey 1942). Wintering peregrine falcons forage over most of California (excluding desert regions). Several peregrine falcon nest territories are present in Butte County including two recently active sites within the study area.

Swainson's hawk

Swainson's hawk is state listed threatened. Swainson's hawks were historically found throughout most of lowland California (Grinnell and Miller 1944). Current distribution is limited to northeast California (primarily Modoc, Siskiyou and Lassen Counties) and the Central Valley. This species decline is believed to be related to agricultural and urban land conversions (Estep 1989). Recent telemetry data indicate that Swainson's hawks nesting in the Central Valley migrate to agricultural areas in Mexico and Central America during the winter.

Swainson's hawks use a variety of agricultural crops for foraging including alfalfa, fallow fields, beet, tomato, irrigated pasture, riceland (non-flooded), and cereal grains.

No Swainson's hawk nest territories are known to occur within the FERC Project Boundary (CDFG 2001). However, several nesting pairs are known from the Butte Creek area near the communities of Durham and Nelson and along the lower Feather River. Suitable foraging habitat in the immediate vicinity of project facilities is generally lacking. Potentially suitable nesting habitat is present at several locations along the Feather River below the Thermalito outfall.

Western yellow-billed cuckoo

The western yellow-billed cuckoo was listed as a State threatened species in 1971. This species status was reclassified to endangered in 1987. This species is currently a federal candidate for listing. Historic records indicate that this species was widespread and locally common in California. Today its distribution is limited to several small isolated areas of the State. The two largest remaining populations in the State are located near the Colorado and Sacramento rivers. The 1977 statewide population was estimated at between 122 and 163 pairs (Gaines and Laymon 1984). A subsequent statewide survey in 1988 estimated that only 31 to 33 pairs remained (Laymon and Halterman 1989). Loss of riparian habitat accounts for most of the population decline (Laymon 1980).

Suitable cuckoo nesting habitat is described as deciduous riparian thickets or forests with dense low understory near slow moving waterways (Ziener et al 1990). These thickets or woodlands are generally at least 25 acres in size and 300 feet in width (Gaines 1974).

At least two historic cuckoo nest territories are known from the lower Feather River near the confluence with the Sacramento River. Several potentially suitable patches of nesting habitat of adequate size are present within the portion of the Oroville Wildlife Area bordering the Feather River.

Vernal pool invertebrates

Three invertebrate species Conservancy fairy shrimp, vernal pool tadpole shrimp, and vernal pool fairy shrimp were federally listed during September 1994. Conservancy fairy shrimp and vernal pool tadpole shrimp are listed as endangered while the vernal pool fairy shrimp is classified as threatened. This group of species is endemic to seasonal wetlands and vernal pools throughout the Central Valley, Coast Range, Transverse Ranges, and coastal plain near Santa Rosa.

These species are totally dependent upon vernal pools and other seasonal wetlands and are not known to occur in rivers, marine habitats or permanent water-bodies. The season and duration of pool inundation, as well as, water chemistry of the pools strongly influences these species. Several reasons for the population decline have been identified including habitat loss (alteration, degradation), urbanization, agricultural practices, recreational impacts, and contaminants.

Potentially suitable vernal pool habitat is present within the study area. Approximately two hundred vernal pools of various sizes have been identified within the portion of the Oroville Wildlife Area surrounding the Thermalito Afterbay, Thermalito Forebay, and Power Canal. However, the presence and or distribution of these species within the study area are currently unknown. Vernal pool fairy shrimp have been reported immediately west of the Thermalito Afterbay near the intersection of State Highway 99 and Richvale Road (CDFG 2001). The proposed study will not include protocol level surveys of vernal pool habitats to detect the presence of fairy and tadpole shrimp. Rather, DWR proposes to manage the block of land containing vernal pools under the assumption that these listed invertebrates are present. DWR will evaluate land management practices within the area containing pools to identify potential impacts and avoidance measures. Current land management practices that will be evaluated include firebreaks, trails, roads, levees, pesticide use, wetland developments, grading, and recreational uses.

Valley elderberry longhorn beetle

The valley elderberry longhorn beetle (VELB) was listed as a federal threatened species during August 1980. The known distribution of this species has greatly increased through additional survey efforts since the time of it's initial listing. USFWS now identifies the species range as throughout the Central Valley and up to 3,000 feet on the eastern edge of the valley and to the Coast Range watershed divide along the western side of the valley (USFWS 1984).

The beetle is primarily restricted to riparian habitat and adjacent uplands. The VELB is dependent upon its host plant the elderberry (*Sambucus* sp.) throughout its life cycle. The VELB spends most of its two-year life cycle boring within the stem in a larval stage. The beetles emerge from the stem March through June as adults to lay eggs completing the life cycle (Barr 1991).

Elderberry bushes containing VELB emergence holes have been identified at several locations within the Oroville Wildlife Area (OWA).

California red-legged frog

The California red-legged frog was listed as a federal threatened species during June 1996. This species is considered a species of special concern by the State. The California red-legged frog has been extirpated from approximately 70 percent of its former range.

The California red-legged frogs are present from sea level up to approximately 5,000 feet elevation with most known populations below 3,500 feet. This species uses a variety of aquatic habitats for reproduction including streams, deep pools, backwaters, ponds, marshes, sag ponds, dune ponds, and lagoons (USFWS 2000). Breeding adults are generally associated with deep (greater than two feet) slow moving water bordered by dense low riparian or emergent vegetation (USFWS 2000). Upland areas near breeding locations can also be used extensively during the summer (USFWS 2000). Several reasons for the population decline have been identified including habitat loss (alteration, degradation, and fragmentation), urbanization, agricultural practices, water management activities, mining, livestock practices, recreational impacts, timber harvest practices, exploitation (as food), disease, introduced species (bullfrog, mosquitofish, largemouth bass), drought and contaminants (USFWS 2000).

California red-legged frogs are not currently known to exist within the project boundary. However, the largest remaining population within the Sierra Nevada mountain range is located within a mile of the project boundary within the North Fork Feather River drainage. Portions of this watershed are designated as core recovery areas in the Draft California Red-Legged Frog Recovery Plan (USFWS 2000).

Giant garter snake

The giant garter snake was listed as a threatened species under the federal Endangered Species Act during October 1993. It has also been listed as threatened under the California Endangered Species Act since 1971.

The giant garter snake is endemic to the wetlands of the Central Valley of California. The historic range is believed to include valley floor wetlands from the vicinity of Butte County south to near Bakersfield. Historically, giant garter snakes were found in natural wetlands associated with flood basins.

Thirteen sub-populations of giant garter snake have been identified. Population information is generally lacking. The northern extent of the current range of this species is described as Sacramento and Contra Costa Counties (Fox 1951), to near Gridley (Hansen and Brode 1980), to the vicinity of Chico (Rossman and Stewart 1987). In addition to natural wetlands, giant garter snakes are now found in agricultural wetlands (rice), managed wetlands (duck clubs and State and federal refuges) agricultural drains, ponds, and other artificial waterways.

The Giant Garter Snake Recovery Plan (Miller and Hornaday 1999) describes the essential habitat components for this aquatic reptile as 1) adequate water during the snakes active season (early spring through mid-fall) to support dense populations of prey; 2) presence of emergent herbaceous cover (cattails and tules) for escape cover and foraging habitat; 3) grassy upland habitat adjacent to waterways for basking; and 4) higher elevation upland habitat for flood flow refuge. This species is absent from larger rivers, riparian woodlands, and wetlands with sand, rock, or gravel substrates (Miller and Hornaday 1999). Within the southern Sacramento Valley this species has been identified in areas ranging from 10 to 40 feet elevation (Hansen 1988).

Giant garter snakes have not been identified within the project boundary. However, this species has been reported in the Cherokee Canal near Richvale (approximately 2 miles west of the Thermalito Afterbay). Rice fields and associated irrigation/drainage canals are present at the western project boundary along State Highway 99. Potentially suitable habitat is present within the study area. Five waterfowl brood ponds have been constructed in and around the Thermalito Afterbay by the Licensee. These ponds are not subject to the water level fluctuations experienced in the Thermalito Afterbay and as a result support extensive emergent wetland habitat. All the components of essential giant garter snake habitat are found in and around these habitat improvement projects.

Southern bald eagle

Southern bald eagles were listed as an endangered species by USFWS in March 1967. After a federal status review they were down-listed to threatened in 1995. They are currently proposed for federal delisting (Federal Register July 6,1999). This species is currently State listed as endangered.

Bald eagles historically nested throughout California near seacoasts, major rivers, and lakes. Over 160 pairs currently nest in California (up from 28 pair in 1978) while hundreds of additional bald eagles migrate into California during the winter.

Nesting habitat is described as old-growth trees and snags in remote mixed stands near water (Zeiner et.al. 1990). In a 1979 survey of 95 bald eagle nest sites in northern California, 87 percent were located in dominant or co-dominant ponderosa pine or sugar pine (Lehman 1979). Associated stands were generally open (less than 40 percent canopy cover), and within one mile of a water body. Approximately 1/3 of the nest sites were within 0.1 miles of a water body and 85 percent of the nests had an unobstructed view of the water body. Seventy percent of the nests were associated with reservoirs.

At least three bald eagle nest territories are present within the project vicinity (Jurek 1990). Plumas National Forest, California Department of Parks and Recreation (DPR) and Pacific Gas and Electric Company (PG&E) manage the lands occupied by these territories and monitor nest occupancy and success. The Poe territory on the North Fork Feather River has been active since at least 1970 and remains one of the most productive nest territories in the State with at least 39 young produced. Nest activity at the Spring Hollow nest territory was first identified in 1989 when two young were produced. Successful reproduction was observed in 1990 and 1991. No further activity was observed at this territory until the territory was occupied in 1997. The Fall River nest territory was identified in 1991. However, use of the territory has been sporadic. No successful reproduction was observed until 1997 when two young were produced. In 1997, the Licensee (in cooperation with USFWS and the Plumas National Forest) constructed and installed a floating log boom to restrict recreational access near the Fall River nest site. Subsequently, DPR personnel have re-installed and maintained the barrier. The DPR has also provided enforcement for the recreational closure. The study area also receives moderate wintering bald eagle use. Moderate, sporadic winter bald eagle use of the Lake Oroville, Feather River below Lake Oroville, and the Thermalito Forebay/Afterbay complex have been observed.

Butte County meadowfoam

Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) is an annual herb in the false mermaid family (Limnanthaceae). It is both a federally and State listed endangered species. This species appears in Late March to early May in ephemeral drainages, vernal pool depressions in ephemeral drainages, and occasionally around the edges of isolated vernal pools. It is restricted to a narrow 25-mile strip along the eastern margin of the Sacramento Valley in Butte County.

Sixteen of the eighteen remaining populations of Butte County meadowfoam occur on private land and are subject to urban development, agricultural land conversion, and highway widening or realignment (Fed. Register, March 26, 1997). Two populations are known from approximately five miles north of the Thermalito Afterbay. Suitable habitat for this species exists within the study area.

Hairy Orcutt grass

Hairy Orcutt grass (*Orcuttia pilosa*) is an annual herb in the grass family (Poaceae). It is listed as a federally endangered and California endangered species. It occurs in drying vernal pools along the eastern margin of the Central Valley from May to September.

Of the original 34 known populations of hairy Orcutt grass, eleven are thought to have been extirpated due to agricultural land conversion, urbanization, and intensive cattle grazing (Fed Register, March 26, 1997). A population is known within five miles of the project boundary and suitable habitat for the hairy Orcutt grass exists within the boundaries.

Slender Orcutt grass

Slender Orcutt grass (*Orcuttia tenuis*) is an annual herb in the grass family (Poaceae). It is listed as a federally threatened and California endangered species. It occurs in drying vernal pools in Northern California from May to October.

There are 39 known populations of the slender Orcutt grass. Although new populations discovered recently have extended its range, the overall trend is one of decline due to habitat alteration and loss (Federal Register, March 26, 1997). Suitable habitat for this species exists within the Project boundary.

Greene's tuctoria

Greene's tuctoria (*Tuctoria greenei*) is an annual herb in the grass family (Poaceae). It is listed as a federally endangered species and a California rare species. It occurs in drying ephemeral wetlands or vernal pools along the eastern margin of the California Central Valley from May to September.

Thirty-eight populations have been documented from Fresno to Shasta Counties. However, nineteen of these populations are thought to have been extirpated from Fresno, Madera, Stanislaus, Tulare, and San Joaquin Counties. The remaining populations occur in Butte, Glenn, Merced, Shasta, and Tehama Counties. All populations are on private lands except for one population at the Sacramento National Wildlife Refuge. One population occurs just west of Hwy 99 within ¼ mile and another within five miles of the project boundary. Suitable habitat for this species exists within the project boundary.

Hoover's spurge

Hoover's spurge (*Chamaesyce hooveri*) is a federally listed threatened species. This annual herb in the spurge family (Euphorbiaceae) is found in relatively large vernal pools on the eastern margin of the Central Valley from July to August.

There are twenty-five known populations of Hoover's spurge from Tulare, Merced, Stanislaus, Glenn, Butte, and Tehama Counties. All are on private lands except for four populations in Glenn County on the Sacramento National Wildlife Refuge. Loss of vernal pool habitat to irrigated agriculture is the biggest threat to this species. The nearest population occurs approximately five miles north of the project boundary. Suitable habitat exists within the study area for this species.

Hartweg's golden sunburst

Hartweg's golden sunburst (*Pseudobahia bahifolia*) is an annual herb in the sunflower family (Asteraceae). It is a federally and State listed endangered species. This species is found on clay soils in annual grassland and open woodland and flowers from March to April.

There are fifteen remaining populations identified in the CNDDB in Madera, Fresno, and Stanislaus Counties. Hartweg's golden sunburst is also known in Yuba County from the floodplain of the lower Feather River. A historic population of Hartweg's golden sunburst was documented on the bank near the junction of the Yuba and Feather rivers. This type locality from the banks near the Feather River has been extirpated. There is little probability of finding this plant within the study area.

Layne's ragwort

Layne's ragwort (*Senecio layneae*) is a federally listed threatened and California rare species. It is a perennial herb in the sunflower family (Asteraceae) found in open pine and oak woodland on serpentine soils. It flowers from April to July.

There are forty-three records of Layne's ragwort identified in the CNDDB from El Dorado, Tuolumne, and Yuba Counties. Four of these are thought to have been extirpated. Thirty-four of the remaining populations occur in El Dorado County and are threatened by urbanization. One population occurs in Yuba County near Brownsville. Suitable habitat occurs within the project area.

2.0 Study Objectives

Provide information on special status species occurrence and distribution within the study area
Provide information on potential project effects to special status species for use in consultation processes with State and Federal wildlife management agencies
Provide information that can be used to identify opportunities for habitat protection and enhancement for special status species

3.0 Relationship to Relicensing /Need for the Study

The Federal Endangered Species Act (FESA) requires evaluation and consultation to avoid take of listed species or adverse modification of their habitats. The California Endangered Species Act (CESA) also requires assessment of the proposed project's impact on listed species. Both CEQA and NEPA require assessment of a project's impacts on State and federally listed species and their habitats. In addition CEQA requires an evaluation of species that have not been listed under the FESA or CESA, but meet the definition of threatened and endangered as listed in the CESA. CEQA requires evaluation of project impacts on State and federal species of concern. Both federal land management agencies have an obligation to insure that project operations do not adversely affect sensitive species on federal lands. NEPA procedures and the policies of the Bureau of Land Management and Forest Service require that information about any ('rare' - pick a word and define it) species regardless of status is available to public officials and citizens before decisions are made and before actions are taken.

With the exception of southern bald eagle and American peregrine falcon, relatively little is known about the occurrence or distribution of State and federally listed species within the project vicinity. These studies are needed to provide sufficient information for these consultations and CEQA/NEPA documentation.

4.0 Study Area

The study area for this investigation includes the FERC Project Boundary and the lower Feather River downstream from the Fish Barrier Dam to the Sacramento River. The scope of study for each species will focus on areas of suitable habitat within the study area that may be affected by project activities. The study area will extend beyond the FERC boundary for evaluation of effects related to the analysis of project operations. The survey area for each special status species is identified in 5.0 General Approach. Study plans approved by the Environmental Work Group define the limits of the study plans. If initial study results indicate that the study area should be expanded or contracted, the Environmental Work Group will discuss the basis for change and revise the study area as appropriate.

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Scope of surveys for BLM and USFS sensitive and USFS Special Interest species will include federal lands within the study area, adjacent federal lands outside the study area, and State lands within the study area adjacent to federal lands.

Study scope related to Federal and State species of concern will be restricted to the FERC boundary and downstream along the Feather River floodplain from the Fish Barrier Dam to the confluence with the

Sacramento River. Information related to project impacts on these species would be collected along with other survey efforts.

5.0 General Approach

If initial study results indicate that the methods and tasks should be modified, the Environmental Work Group will discuss the basis for the change and review the study plans as appropriate.

Animals

The diversity of habitat types associated with the FERC project boundary and lower Feather River provide potentially suitable conditions for 12 species listed under FESA or CESA. These habitats could support an additional 56 species of special concern to federal and State agencies. These special status species are listed in Table 1 below.

Table 1. Special Status Wildlife Species With The Potential to Occur In TheImmediate Project VicinitySpeciesStatusSpeciesStatusAmerican bitternMNWestern yellow-billed cuckooSE, MNAmerican peregrine falconSE, MN, FPWhite-faced ibisCS, MNAmerican white pelicanCSYellow-breasted chatCS, MNBank swallowSTCalifornia red-legged frogFT, CS, PBarrow's goldeneyeCSFoothill yellow-legged frogCS, FC, FS, PBell's sage sparrowCS, MNWestern spadefoot toadCS, FC, BS, PBlack swiftCS, MNCalifornia horned lizardCS, FC, BS, PBlack ternCS, MNGiant garter snakeFT, ST, PBlack-crowned night heronBSNorthwestern pond turtleCS, FC, FS, PBlack-shouldered kiteMN, FPWestern mastiff batCS, FC, BSBrewer's sparrowMNFringed myotis batFC, BSCalifornia gullCSLong-eared myotis batCS, FC, California horned larkCSLong-legged myotis batFC, BSCommon loonCS, MNMarysville kangaroo ratCS, FC, BSCooper's hawkCSOccult little brown batCS, FC, BSDouble-crested cormorantCSPale big-eared batCS, FC, FS. BSFerruginous hawkCS, MN, BSPallid batCS, FS, BSGolden eagleCS, FPSan Joaquin pocket mouseCS, FC, BSGrasshopper sparrowMNSmall-footed myotis batFC, BSGreater sandhill craneST, FPSpotted batCS, FC, BSLawrence's goldfinchMNTowndsend's western big-eared batCS, FC, FS, BSLoggerhead shrikeCS, MNYuma myotis batFC, BSLong-billed curlewCS, MNAmphibious caddisflyFCLong-eared owlCSConservancy fairy shrimpFEMerlinCSLonghorn fairy shrimpFENorthern harrierCSSacramento anthicid beetleFCOspreyCSSacramento valley tiger beetleFCPrairie falconCSValley elderberry longhorn beetleFTPurple martenCSVernal pool fairy shrimpFTSharp-shinned hawkCSVernal pool tadpole shrimpFEShort-eared owlCS, MNKEYSouthern bald eagleSE, FT, FPSE=State EndangeredSwainson's hawkSTST=State ThreatenedTricolored blackbirdCS, MN, BSFE=Federal EndangeredVaux's swiftCS, MNFT=Federal ThreatenedWestern burrowing owlCS, MN, BSP=California ProtectedWestern least bitternCS, MNFS=Forest Service SensitiveYellow warblerCSBS=Bureau of Land Management Sensitive Status per CDFG California Natural Diversity Database-July 2001FP=California Fully Protected SpeciesCalifornia spotted owl Western red batCS, FS, BS FSCS=California Species of Special ConcernWillow flycatcherSE, FSFC=Federal Species of ConcernNorthern goshawkCS, MN, FSMN=Migratory Nongame Birds of River otterFS Management Concern

The following is a description of the study methods that will be used to determine the status of occurrence and project effects on special status animals within the study area. If initial study results indicate that the methods and tasks should be modified, the Environmental Work Group will discuss the basis for change and revise the study plans as appropriate.

Task 1-Bank Swallow

No bank swallow colonies have been identified within the project boundary. However, numerous colonies occur along the lower Feather River. DWR Oroville Facilities maintenance activities and/or changes in Oroville project operations that alter bank formation processes may disturb these nesting colonies. The following investigations would be conducted to evaluate project effects on bank swallows.

Scope of survey. DWR proposes to conduct annual summer (June) surveys of the bank swallow colonies along the Feather River from the Fish Barrier Dam to the confluence with the Sacramento River. These boat-based surveys will evaluate the location, quantity, and quality of habitat and develop a population estimate based on the number of burrows in occupied colonies. Survey efforts will be coordinated with DFG.

Evaluation for project effects. Project-related effects on bank swallow nesting colonies will be based on onsite identification of potential disturbances, review of proposed DWR Oroville Facilities maintenance activities and an assessment of potential project water operations that may alter bank-forming processes. Bank formation will be assessed based on hydrological modeling and additional information collected under SP-G2. This analysis will focus on the timing, magnitude, and frequency project releases and erosion events within the Feather River below the Thermalito outfall. Bank protection activities will be assessed for potential alteration of bank forming processes and direct effects due the nest removal and nesting disturbance.

Task 2-Greater Sandhill Crane

DFG records indicate that greater sandhill cranes may be present in grassland habitats near the Thermalito Afterbay on rare occasions. However, DFG experts indicate that these occurrences are rare enough that survey efforts are unlikely to detect wintering greater sandhill cranes. DFG staff have requested that DWR assume that rare wintering sandhill crane use may occur. Further, DFG requested that a desktop study of potential project effects on roosting, loafing, and foraging cranes be completed. Potential project effects include adverse habitat modification, water level fluctuations, and project related disturbance/displacement associated with human activity.

Scope of Survey. Potential greater sandhill crane habitat within the project boundary is restricted to the Thermalito Afterbay and surrounding grasslands. Adjacent agricultural lands (principally rice) on the western project boundary provides suitable foraging and roosting habitat. Evaluation of potential project effects will be evaluated within this portion of the project area and within ¼ mile of the project boundary in suitable adjacent habitats.

Evaluation of Project Effects. A desktop analyses of potential project effects on the rare occurrence of wintering greater sandhill cranes will be conducted. Evaluation of potential project effects will include vegetative management practices, water level fluctuations, and disturbance/displacement of cranes associated with maintenance and recreational activities.

Task 3-American Peregrine Falcon

American peregrine falcons are known to occur within the study area on a year-round basis. The project facilities provide suitable foraging habitat for falcons that nest within the project vicinity as well as wintering birds. Project activities have the potential to cause disruption of nesting birds due to project maintenance activities or recreational activities. The following survey is proposed to 1) identify all nesting sites within the study area; 2) evaluate all project activities and identify land uses within at least one mile of nest sites for the potential to reduce nesting success.

Scope of survey. Several peregrine falcon nest territories are present in Butte County including two recently active sites within the FERC project boundary. DWR will monitor habitat use, reproduction, and project-related impacts at the two known nest locations. Further, DWR will evaluate and survey the limited amount of potentially suitable unoccupied habitat (cliffs and bridges) within the FERC project boundary. These surveys will be conducted bimonthly during the spring breeding season. Annual surveys will be completed during both 2002 and 2003. Boat, vehicle, and foot surveys of potential nesting habitat will be required. DWR will coordinate survey efforts with DFG.

Evaluation for project effects. Data analyses will include evaluation of reproductive success, existing population levels, habitat location and use, potential project effects and potential management options. Evaluation of potential project effects will include bridge maintenance and access, toxins, recreational use of cliffs (rock climbing) and vegetative management.

Task 4-Swainson's Hawk

Within the study area, potentially suitable nesting habitat is present at several locations along the Feather River below the Thermalito outfall. Swainson's hawks are known to nest along the Feather River from the Fish Barrier Dam to the Sacramento River, and are expected to forage in croplands adjoining the river. Project-related operations that may disturb Swainson's hawk nest sites during the nesting season could result in nest abandonment and impaired nesting success. Project releases could alter the recruitment of riparian trees for Swainson's hawk nesting. The following study would 1) collect site specific data on Swainson's hawk nesting within the project boundary, , 2) evaluate these nesting territories for project-related operations that may disturb nesting activities ; and 3) assess the effects of project water operations on the recruitment of riparian vegetation in the Feather River from the Fish Barrier Dam to the Sacramento River for potential future nest sites.

Scope of survey. DWR proposes to conduct breeding season surveys of suitable nesting habitat within the project boundary using the Draft Swainson's Hawk Recovery Team protocol (CDFG 1992). This protocol (attached) requires three surveys of potentially suitable habitat during the course of the breeding season. This protocol also requires evaluation of project effects on foraging habitat within five miles of known nest locations. Both boat and vehicle surveys will be employed. During field investigations, nest sites will be identified in the field and mapped. Field observations will note the status of each nest, alternate nest sites, and potential project-related activities within one half mile of the nest. DWR will assume presence of nesting Swainson's hawk within the Feather River floodplain and evaluate potential project related effects including hydrologic effects on the maintenance of nesting habitat.

Evaluation for project effects. Data analyses within the project boundary will include evaluation of existing population, habitat location and use, potential project effects, and potential management options. Evaluation of project effects within the project boundary will include hydrology effects on the maintenance and development of mature riparian/valley oak habitat (SP-T3-5), and Oroville Facilities maintenance practices. Evaluation of project effects on areas within the Feather River floodplain outside of the project area will focus on hydrology effects on the maintenance of nesting habitat.

Task 5-Western Yellow-billed Cuckoo

At least two historic cuckoo nest territories were identified along the Feather River near the confluence with the Sacramento River. Several potentially suitable patches of nesting habitat (20 acres with minimum width of 300 feet) are present in the study area within the Oroville Wildlife Area (OWA) bordering the Feather River.

Scope of Survey DWR will conduct annual breeding season surveys (during 2002 and 2003) of potential nesting habitat at these sites and downstream along the Feather River floodplain from the Fish Barrier Dam to the confluence with the Sacramento River. These surveys would involve broadcasting pre-recorded cuckoo calls and soliciting responses during the spring breeding season. These surveys would involve both boat and vehicular access.

Evaluation for Project Effects Data analyses will include evaluation of existing population, habitat location and use, potential project effects, and potential management options. Evaluation of project effects will include hydrology effects on the maintenance and development of mature riparian habitat (SP-T3), and vegetative management practices.

Task 6-Valley Elderberry Longhorn Beetle

Elderberry shrubs are known to occur throughout the FERC project boundary. At some locations, emergence holes for the valley elderberry longhorn beetle (VELB) have been identified. Potentially suitable habitat for VELB could be removed during maintenance activities within the FERC project boundary; or altered by project water operations along the lower Feather River. DWR proposes to identify all areas of suitable habitat for VELB, and conduct USFWS protocol level surveys in areas where suitable habitat could be reduced or modified by project operations or maintenance. The following describes the study approach for each of these areas.

Scope of survey. Surveys will be conducted within the study area to 1) provide information necessary to develop protection measures within the Oroville Wildlife Area (OWA); 2) determine if project operations

affect elderberry occurrences on the lower Feather River; and 3) evaluate the effects of facilities maintenance within the FERC project boundary.

Oroville Wildlife Area. Elderberry bushes are one of the most common shrub species within the portion of the OWA bordering the Feather River. Thousands (possibly tens of thousands) of elderberry stems greater than one inch in diameter are present in this area. DWR will continue to manage these areas for wildlife habitat without the addition of new facilities or ground-disturbing activities that would remove these plants. DWR will map these locations and determine density and beetle occupancy rates through subsampling. . These elderberry stands will also be assessed for intentional flood detention within the OWA, gravel mining, Oroville Facilities maintenance, and herbicide/pesticide use.

Lower Feather River. DWR will conduct field surveys and map elderberry locations along the lower Feather River from the Fish Barrier Dam to the confluence with the Yuba River. Three sampling sites will be co-located with river transects established under SP-G2. During these field surveys at these sampling sites, the elevation of the elderberry occurrences will be taken relative to the river to allow for an assessment of potential impacts due to project water operations. Elderberry tolerance for flooding (frequency and duration) will be established by correlating the hydrologic modeling results with the stage-discharge relationship at each transect. Evaluation of direct impacts on VELB and its habitat will also be conducted, including analysis of DWR Oroville Facilities maintenance practices.

Recreation and Generation Facilities. DWR will survey within 100 feet of all recreation and generation facilities in keeping with the USFWS protocol during 2003. DWR will survey proposed sites for recreation improvement using USFWS protocol during 2004.

Evaluation for project effects. The potential for loss of suitable VELB habitat will be assessed based on the results of field surveys and 1) maintenance practices within the OWA; 2) historic and alterative water releases from the project within the lower Feather River; and 3) maintenance practices at all of the project facilities (generation and operation). The final assessment will include the results of field investigations, and a description of activities that could or would remove suitable habitat for VELB.

Task 7-California Red-legged Frog

There are no known occurrences of California red-legged frog within the study area. Suitable habitat for California red-legged frog includes ponds, slow-moving streams, and wetland areas. These habitat types may occur throughout the study area. Suitable habitat for California red-legged frog may be affected by ground disturbing activities, vegetation removal, introduction of predators, pesticides, and hydrologic changes. The proposed study would survey areas of suitable habitat and evaluate these sites for potential adverse affects related to the project.

Scope of survey. DWR will conduct surveys of potentially suitable California red-legged frog habitat using the USFWS survey protocol in areas affected by project operations (see attached protocol). DWR will conduct these surveys in four steps: 1) identification of areas where project related effects may occur, 2) within the areas identified in Step 1, identify potential red-legged frog habitat on habitat maps produced under SP-T4, 3) field survey areas delineated in Step 2 per the USF&WS protocol to determine habitat suitability, and 4) conduct red-legged frog surveys per USF&WS protocol within areas of potentially suitable habitat identified in Step 3. This protocol requires at least four surveys (two diurnal and two nocturnal) conducted between May 1st and November 1st.

Evaluation for project effects. California red-legged frog occurrences will be evaluated for project-related effects based on proximity to project facilities and project-related activities (maintenance, recreation, etc). Data analyses will include an evaluation of the existing population, habitat location and use, project effects, and potential management options. Evaluation of project effects will include effects on habitat alteration, introduced competitors/predators, vegetative management practices, and recreational impacts.

Task 8-Giant Garter Snake

While giant garter snakes are not known to occur within the study area, suitable habitat for this species has been identified in agricultural areas west of the Afterbay. Giant garter snakes at this location could be affected by changes in water management, introduction of predators, vegetation removal, recreational activities, and pesticide application.

Scope of survey. Delineation of potentially suitable habitat will be conducted in consultation with USFWS and CDFG. USFWS has suggested that DWR assume presence of giant garter snake in these areas of potential habitat and conduct evaluation of potential project effects within these areas rather than survey per protocol.

Evaluation for project effects. Evaluation of project effects will include analyses of water level fluctuations within the Thermalito Afterbay and brood ponds, DWR Oroville Facilities maintenance practices, flood detention within the OWA, pesticide use, vegetative management, and recreation use.

Task 9-Southern Bald Eagle

Lake Oroville supports several bald eagle nesting territories and a wintering population of bald eagles. Project-related disturbances at nest sites and roosting sites should be avoided. The project could also alter habitat through vegetative/ fuels management practices and reservoir level fluctuations. The following study would 1) collect data on the occurrence bald eagle nesting and roosting sites within the study area; and 2) evaluate the likelihood for project-related disturbances within one mile of occupied nests or roost sites. 3) collect data on habitat alterations related to vegetative/fuels management and reservoir operations.

Scope of survey. DWR will conduct annual breeding surveys (during 2002 and 2003) of currently know and potentially suitable nesting habitat as well as Project area-wide wintering surveys. Potentially suitable nesting habitat will be delineated in consultation with both USFWS and CDFG. Nest surveys will be conducted from a boat and will involve glassing all potentially suitable nest trees to detect new or previously undetected nests, following adult birds, monitoring reproduction, identification of foraging areas, and a field assessment of potential for project related effects. Bimonthly surveys will be conducted during the breeding season to monitor reproductive success at occupied nests and delineate habitat use. Wintering habitat surveys will be conducted on a single date in January using multiple observers to cover suitable wintering habitat within the study area on that date. If possible this survey will be coordinated with statewide survey efforts.

Evaluation for project effects. Data analyses will include evaluation of the existing population, reproductive success, habitat location and use, project effects, and potential management options. Evaluation of project effects will include recreational disturbance of nesting and wintering eagles, vegetative and fuels management, and reservoir level effects on nesting eagles.

Task 10-Federal Land Management Agency Sensitive Species

Both the Bureau of Land Management and Plumas National Forest manage federal lands within the project boundary. These lands have the potential to support federal sensitive species including tricolored blackbird, western burrowing owl, foothill yellow-legged frog, western spadefoot, western pond turtle, fringed myotis, long-eared myotis, long-legged myotis, pallid bat, small-footed myotis, Townsend's big-eared bat, Pacific big-eared bat, Yuma myotis, western red bat, willow flycatcher, California spotted owl, river otter, and northern goshawk.. Relatively little information exists on the occurrence or distribution of these species on federal lands within the study area.

Scope of surveys. Surveys will be conducted on federal lands within the FERC project boundary, adjacent federal lands outside the project boundary, and State lands within the project boundary adjacent to federal lands to assess habitat conditions for federal sensitive species. During field investigations, vegetation structure and composition will be noted, as well as, disturbance factors that may preclude habitat use by federally sensitive species. The survey crew will include staff qualified to identify Forest Service sensitive species and their habitats. The locations of sensitive species observed during the habitat assessment will be mapped. Sampling surveys to identify presence would be conducted if project activities are found to impact special status species' habitat.

Evaluation for project effects. DWR will assess habitat conditions for federal sensitive species on federal lands. This investigation will include field assessments of wildlife habitat and an evaluation of habitat conditions using the California Wildlife Habitat Relations system. The information collected under these surveys will be used to evaluate potential project effects on federal land management agency's sensitive species. Evaluation of potential project effects on these species will include analyses of Lake Oroville water level fluctuations, vegetation and fuels management practices, recreational use, and maintenance practices.

Task11-State and Federal Species of Concern

Numerous species classified as California Species of Special Concern, federal species of concern, State fully protected species, or federal migratory non-game birds of management concern are known to occur in the project vicinity (Table 1).

Scope of surveys. Field surveys will be conducted assess habitat conditions for species of State and federal concern. Field assessment sites will be selected from representative habitat units identified from vegetation mapping (Study #T4). During field investigations, vegetation structure and composition will be noted, as well as, disturbance factors that may preclude habitat use by state and federally sensitive species. A qualified wildlife biologists will conduct all habitat assessments. The locations of species of concern observed during the habitat assessment will be mapped

Evaluation for project effects. Habitat for species of concern will be assessed by review of vegetation mapping, onsite field evaluation, and habitat modeling with CWHR. Information on the occurrence and distribution of these species will be collected during surveys or study efforts of Study #T2, Study #T3, Study #T4, SP-T8, Study #T9, and Study #T10. A brief evaluation of potential project effects will be developed for each species for inclusion in the CEQA-NEPA documents.

Task 12 Vernal Pool Invertebrates

Several federally listed vernal pool invertebrates may occur within portions of the FERC project area. At least one of these species is known to occur immediately adjacent to the project boundary.

Scope of surveys. All vernal pool habitats within the FERC project area have been identified and mapped. Approximately 200 vernal pools of various sizes occur in a relatively small area near the Thermalito Afterbay, Power Canal, and Thermalito Forebay. DWR will assume presence of these species and manage the area containing vernal pools to maintain or enhance vernal pool habitat. No protocol level surveys for listed vernal pool invertebrates are planned.

Evaluation of project effects. DWR will evaluate land management practices within the area containing pools to identify potential impacts and avoidance measures. Current land management practices that will be evaluated include firebreaks, trails, roads, levees, pesticide use, wetland developments, off-road vehicle access and use, grading, and recreational uses.

Plants

There are no known occurrences of federal or State listed endangered, threatened, or rare plant species within the FERC Project boundary. However, a preliminary review of existing literature indicates that the study area may support seven species that are listed under FESA or CESA and an additional 36 species of concern. These species of concern include former USFWS Category 2 candidate species and species of concern to USFS, BLM and/or the California Native Plant Society. Table 2 identifies all listed plant species and species of concern that occur or have potential for occurring within the Project boundary.

In addition, the surrounding area may potentially support seven additional species listed by the California Native Plant Society as List 4 species or by USFS as Special Interest species (Table 3). These plants are considered to be limited in distribution and may warrant a higher listing in the future.

Six plant species of concern are known to occur within the project boundaries. They include Mosquin's clarkia, Ahart's dwarf rush, fox sedge, four-angled spikerush, Butte County calycadenia, and Brandegee's clarkia. These species are not listed or currently proposed for listing but their rarity warrants further investigation and they may be listed in the future.

Table 2. Special status plant species with potential for occurring within the Oroville Facilities Project Area.Scientific nameStatusHabitat (elevation)Flowering Common nameFWS1State2CNPS3PNF4periodFederal or State listed*Chamaesyce hooveri* Hoover's spurgeFT1BVernal pools (25-250m)Jul-Aug*Limnanthes floccosa* ssp. *californica* Butte County meadow foamFESE1BValley and foothill grassland (mesic), vernal pools (50-930m)Mar-May*Orcuttia pilosa* Hairy Orcutt grassFESE1BVernal pools (55-200m)May-Sep*Orcuttia tenuis* Slender Orcutt grassFTSE1BVernal pools (35-1760m)May-Oct*Pseudobahia bahiifolia* Hartweg's golden sunburstFESE1BCismontane woodland, valley and foothill grassland/ clay (15-150m)Mar-Apr*Senecio layneae* Layne's ragwortFTSR1BFTChaparral, cismontane woodland/ serpentinite or gabbroic, rocky (200-1000m)Apr-Jul*Tuctoria greenei* Greene's tuctoria FESR1BVernal pools (30-1070m)May-SepSpecies of Concern*Agrostis hendersonii* Henderson's bent grassSC 3SI-2Valley and foothill grassland (mesic), vernal pools (70-305m)Apr-May*Allium jepsonii* Jepson's onionSC 1BSCismontane woodland, lower montane coniferous

forest/ serpentinite or volcanic (300-1160m)May-Aug*Astragalus tener* var. *ferrisiae* Ferris's milk-vetchSC 1BMeadows and seeps (vernally mesic), valley and foothill grassland (subalkaline flats) (5-75m)Apr-May*Atriplex cordulata* HeartscaleSC 1BChenopod scrub, meadows and seeps, valley and foothill grassland (sandy)/ saline or alkaline (1-375m)Apr-Oct*Atriplex depressa* Brittlescale1BChenopod scrub, meadows and seeps, valley and foothill grassland, vernal pools/ alkaline, clay (1-320m)May-Oct*Atriplex minuscula* Lesser saltscale1BChenopod scrub, playas, valley and foothill grassland/ alkaline, sandy (15-200m)May-Oct*Atriplex subtilis* Subtle orache1BValley and foothill grassland (40-100m)Aug-Oct*Balsamorhiza macrolepis* var. *macrolepis* Big-scale balsamroot1BSI-1Chaparral, cismontane woodland, valley and foothill grassland / sometimes serpentinite (90-1400m)Mar-Jun*Calycadenia oppositifolia* Butte County calycadenia1BSChaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland/ volcanic or serpentinite (215-945m)Apr-Jul*Calystegia atriplicifolia* ssp. *buttensis* Butte County morning gloriySC1BSLower montane coniferous forest (600-1200m)May-Jul*Cardamine pachystigma* var. *dissectifolia* Dissected-leaved toothwort3SI-1Chaparral, lower montane coniferous forest/ usually serpentinite, rocky (255-2100m)Feb-May*Carex vulpinoidea* Fox sedge2Marshes and swamps (freshwater), riparian woodland (30-1200m)May-Jun*Castilleja rubicundula* ssp. *rubicundula* Pink creamsacs1BChaparral (openings), cismontane woodland, meadows and seeps, valley and foothill grassland/ serpentinite (20-900m)Apr-Jun*Clarkia biloba* ssp. *brandegeae* Brandegee's clarkia1BSChaparral, cismontane woodland/ often roadcuts (295-885m)May-Jul*Clarkia gracilis* ssp. *albicaulis* White-stemmed clarkia1BSChaparral, cismontane woodland/ sometimes serpentinite (245-1085m)May-Jul*Clarkia mildrediae* ssp. *mildrediae* Mildred's clarkia1BSI-1Cismontane woodland, lower montane coniferous forest/ sandy, usually granitic (245-1710m)May-Aug*Clarkia mosquinii* Mosquin's clarkiaSC51BSCismontane woodland, lower montane coniferous forest/ rocky, roadsides (185-1170m)May-Jul*Cypripedium fasciculatum* Clustered lady's slipperSC4SLower montane coniferous forest, north coast coniferous forest/ usually serpentinite seeps and stream beds (100-2435m)Mar-Jul*Delphinium recurvatum* Recurved larkspurSC1BChenopod scrub, cismontane woodland, valley and foothill grassland/ alkaline (3-750m)Mar-May*Downingia pusilla* Dwarf downingia2Valley and foothill grassland (mesic), vernal pools (1-445m)Mar-May*Eleocharis quadrangulata* Four-angled spikerush2Marshes and swamps (freshwater) (30-500m)May-Sep*Fritillaria eastwoodiae* Butte County FritillarySC3SChaparral, cismontane woodland, lower montane coniferous forest (openings)/ sometimes serpentinite (50-1500m)Mar-May*Fritillaria pluriflora* Adobe-lilySC1BChaparral, cismontane woodland, valley and foothill grassland/ often adobe (60-705m)Feb-Apr*Hibiscus lasiocarpus* Rose-mallow2Marshes and swamps (freshwater) (0-120m)Jun-Sep*Juncus leiospermus* var. *ahartii* Ahart's dwarf rushSC1BValley and foothill grasslands (mesic) (30-100m)Mar-May*Juncus leiospermus* var. *leiospermus* Red Bluff dwarf rush1BChaparral, cismontane woodland, meadows and seeps, valley and foothill grassland, vernal pools/ vernally mesic (35-1020m)Mar-May*Lewisia cantelovii* Cantelow's lewisia1BSBroadleaved upland forest, chaparral, cismontane woodland, Lower montane coniferous forest/ mesic, granitic, sometimes serpentinite seeps (385-1370m)May-Oct*Lupinus dalesiae* Quincy lupine1BSChaparral, cismontane woodland, lower montane coniferous forest, upper montane coniferous forest/ openings, often in disturbed areas (855-2500m)May-Aug*Monardella douglasii* ssp. *venosa* Veiny monardellaSC1BCismontane woodland, valley and foothill grassland (heavy clay) (60-410m)May-Jul*Myosurus minimus* ssp. *apus* Little mousetailSC3Valley and foothill woodland, vernal pools (alkaline) (20-640m)Mar-Jun*Paronychia ahartii* Ahart's paronychiaSC1BCismontane woodland, valley and foothill grassland, vernal pools (30-510m)Mar-Jun*Penstemon personatus* Closed-throated beardtongueSC1BSChaparral, lower montane coniferous forest, upper montane coniferous forest/ metavolcanic (1065-2120m)Jun-Sep*Rhynchospora californica* California beaked-rushSC1BBogs and fens, lower montane coniferous forest, meadows and seeps (seeps), marshes and

swamps (freshwater) (45-1010m)May-July*Rhynchospora capitellata* Brownish beaked-rush2SI-1Lower montane coniferous forest, meadows and seeps, marshes and swamps, upper montane coniferous forest/ mesic (455-2000m)Jul-Aug*Sagittaria sanfordii* Sanford's arrowheadSC 1BMarshes and swamps (assorted shallow freshwater) (0-610m)May-Oct*Sanicula tracyi* Tracy's sanicleSC6 4Cismontane woodland, lower montane coniferous forest, upper montane coniferous forest/ openings (100-1585m)Apr-Jul*Sedum albomarginatum* Feather River stonecrop1BSChaparral, lower montane coniferous forest/ serpentinite (260-1785m)May-Jun*Senecio eurycephalus* var. *lewisrosei* Cut-leaved ragwort1BSChaparral, cismontane woodland, cower montane coniferous forest/ serpentinite (550-1470m)Mar-Sep*Sidalcea robusta* Butte County checkerbloomSC1BChaparral, cismontane woodland (90-1600m)Apr-Jun*Silene occidentalis* ssp. *longistipitata* Long-stiped catchflySC1BSI-1Chaparral, lower montane coniferous forest, upper montane coniferous forest (1000-2000m)Jul-Aug*Trichocoronis wrightii* var. *wrightii* Wright's trichocoronis2Meadows and seeps, marshes and swamps, riparian scrub, vernal pools/ alkaline (5-435m)May-Sep*Trifolium jokerstii* Butte County golden clover1BSI-1Valley and foothill grassland (mesic), vernal pools (50-385m)Apr-May*Vaccinium coccineum* Siskiyou Mountains huckleberry3SI-1Lower montane coniferous forest, upper montane coniferous forest/ often serpentinite (1095-2135m)Jun-AugBryophytes*Anomobryum filiforme* Filiform anomobryum moss2SI-1Broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest/ damp rock and soil on outcrops, usually on roadcuts (100-1000m)*Bruchia bolanderi* Bolander's bruchia moss2SLower montane coniferous forest, meadows and seeps, upper montane coniferous forest/ damp soil (600-1700m)*Meesia triquetra* Meesia moss2SBog and fens, meadows and seeps, upper montane coniferous forest (mesic)/ soil (1300-2500m)*Meesia uliginosa* Meesia moss2SMeadows and seeps, upper montane coniferous forest/ damp soil (1300-2500m)*Mielichhoferia elongata* Elongate copper moss2SI-1Cismontane woodland (metamorphic rock, usually vernally mesic) (500-1300m)Lichens*Caloplaca subpyraceella* Orange lichenSI-1*Hydrothyria venosa* WaterfanSAttached to rocks in cool mountain brooks and streams; must grow entirely submerged in fresh water*Phaeophyscia decolor* Starburst shadow lichenSI-1On rock in exposed situations*Protoparmelia badia* Chocolate rim-lichensSI-1On granitic rocks, usually in well-lit sites*Rhizoplaca glaucophana* Rimmed navel lichenSI-1On siliceous or calcareous rock, or unattached (vagrant) on soil, in open, especially dry sites*Rhizoplaca marginalis* Rimmed navel lichenSI-1On siliceous or calcareous rock, or unattached (vagrant) on soil, in open, especially dry sites*Xanthoparmelia mougeotii* Rock-shield lichensSI-1On rocks, especially siliceous, noncalcareous types, and on mineral soil; most species in open, relatively dry sites, although a few species can tolerate shade and thrive on forest boulders; very rarely, on hard weathered wood1 United States Fish and Wildlife Service (FWS): FE - federal endangered, FT - federal threatened, SC - federal species of concern (not a formal listing).2 California Department of Fish and Game (DFG): SE - State endangered, SR - State rare.3 California Native Plant Society (CNPS): List 1B - plants rare, threatened, or endangered in California and elsewhere; List 2 - plants rare, threatened, or endangered in California but more common elsewhere; List 3 - plants about which more information is needed; List 4 - plants of limited distribution.4Plumas National Forest (PNF): S - Sensitive; SI-1 - Special Interest category 1 (Survey and recommend conservation measures); SI-2 - Special Interest category 2 (Report occurrences and recommend conservation measures).5FWS recognizes two subspecies of *Clarkia mosquinii*, ssp. *mosquinii* and ssp. *xerophila*, both as SC.6Although FWS lists this species as within the vicinity of the project area, PNF and CNPS consider it to only occur in Humboldt and Trinity Counties.

Table 3. Low priority special status plant species with potential for occurring within the Oroville Facilities Project Area.Scientific nameStatusHabitat (elevation)Flowering Common nameCNPS1PNF2Period*Allium sanbornii* var. *sanbornii* Sanborn's onion4SI-1Chaparral, cismontane woodland, lower montane coniferous

forest/ usually serpentinite, gravelly (260-1410m)May-Sep*Arenaria* "grandiflora" Large-flowered sandwortSI-1Granite sand on road banks and openings in woods (500-1000m)Apr-Aug*Astragalus pauperculus* Depauperate milk-vetch4Chaparral, cismontane woodland, valley and foothill grassland/ vernally mesic, volcanic (60-855m)Mar-Jun*Azolla mexicana* Mexican mosquito fern4Marshes and swamps (ponds, slow water) (30-100m)Aug*Bulbostylis capillaris* Thread-leaved beakseed4SI-2Lower montane coniferous forest, meadows and seeps, upper montane coniferous forest (395-2075m)Jun-Aug*Clarkia mildrediae* ssp. *lutescens* Golden-anthered clarkia4SI-1Cismontane woodland, lower montane coniferous forest (openings)/ often roadcuts (275-1750m)Jun-Aug*Eleocharis parvula* Small spikerush4Marshes and swamps (1-2530m)Jun-Sep*Erigeron petrophilus* var. *sierrensis* Northern Sierra daisy4SI-2Cismontane woodland, lower montane coniferous forest, upper montane coniferous forest/ sometimes serpentinite (300-1980m)Jun-Oct*Hesperevax caulescens* Hogwallow starfish4Valley and foothill grassland (mesic, clay) (0-505m)Mar-Jun*Lasthenia ferrisae* Ferris's goldfields4Vernal pools (alkaline, clay) (20-700m)Feb-May*Lilium humboldtii* ssp. *humboldtii* Humboldt lily4SI-1Chaparral, lower coniferous forest/ openings (30-1800m)May-Jul*Microseris sylvatica* Sylvan microseris4Chaparral, cismontane woodland, Great Basin scrub, pinyon and juniper woodland, valley and foothill grassland (serpentinite) (45-1500m)Mar-Jun*Mimulus glaucescens* Shield-bracted monkeyflower4SI-1Chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland/ serpentinite seeps (60-1240m)Feb-Aug*Mimulus laciniatus* Cut-leaved monkeyflower4Chaparral, lower montane coniferous forest, upper montane coniferous forest/ mesic, granitic (490-2650m)Apr-Jul*Navarretia cotulifolia* Cotula navarretia4Chaparral, cismontane woodland, valley and foothill grassland/ adobe (4-1830m)May-Jun*Navarretia heterandra* Tehama navarretia4Valley and foothill grassland (mesic), vernal pools (30-945m)Apr-Jun*Perideridia bacigalupii* Bacigalupi's yampah4SI-1Chaparral, lower montane coniferous forest/ serpentinite (450-1000m)Jun-Aug*Piperia colemanii* Coleman's rein orchid4Chaparral, lower montane coniferous forest/ often sandy (1200-2300m)Jun-Aug*Stellaria obtusa* Obtuse starwort4Upper montane coniferous forest/ mesic (150-2135m)May-Oct*Streptanthus drepanoides* Sickle-fruit jewel-flower4Chaparral, cismontane woodland, lower montane coniferous forest/ serpentinite (275-1660m)Apr-Jun*Viola tomentosa* Woolly violet4SI-1Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest/ gravelly (1435-2000m)May-Oct*Wolffia brasiliensis* Columbian watermeal2Marshes and swamps (assorted shallow freshwater) (30-100m)Apr-Dec1 California Native Plant Society (CNPS): List 1B - plants rare, threatened, or endangered in California and elsewhere; List 2 - plants rare, threatened, or endangered in California but more common elsewhere; List 3 - plants about which more information is needed; List 4 - plants of limited distribution.2Plumas National Forest (PNF): S - Sensitive; SI-1 - Special Interest category 1 (Survey and recommend conservation measures); SI-2 - Special Interest category 2 (Report occurrences and recommend conservation measures).

The following tasks will be used to identify populations of special status plants and evaluate these occurrences for potential project-related impacts.

Task 1-Collect Existing Information

Collect existing information on special-status plant species that have potential for occurring in or near the study area. This data will be compiled from 1) CDFG Natural Diversity Database records (CNDDB); 2) Letter dated 12/10/99, USFWS to Chief, DWR Northern District regarding request for federally endangered and threatened species list for relicensing studies; 3) California Native Plant Society Inventory, 6th Ed.; 4) Plumas National Forest Sensitive Plant and Special Interest Species; 5) CDFG's Special Plants List, January 2001; 6)

other State and/or County biological survey records; and 7) USFS Pacific Southwest Region Sensitive Plant list.

Conduct a literature survey to collect additional distribution and ecology information. In addition, survey botanists will familiarize themselves with individual species morphology and ecology by visiting local herbaria and extant populations prior to field searches. Vegetation and soils maps (from SP-T4 and SP-G1/2) will be used to help predict special status plant habitats within the study area.

Task 2-Field Surveys

Surveys will be conducted according to California Native Plant Society guidelines. Surveys will be floristic in nature and will be conducted to coincide with the flowering period of the target species. Some areas may need to be visited more than once if multiple species have potential for occurring in the area. Surveys will be focused in areas where project impacts are likely to occur.

All species will be identified by qualified botanists, either in the field or later at the California State University (CSU) Chico Herbarium. If a special status plant population is located, detailed site and population information will be recorded, a CNDDB field survey form will be completed, the location mapped, and population photographed. Voucher specimens of non-listed species will be deposited with the CSU Chico Herbarium. On National Forest Lands voucher species are required for sensitive, special interest and species new to the Plumas County and Plumas National Forest Flora. One specimen per project area shall be submitted to the Plumas National Forest. No collections will be required for rare plant populations of less than 20 individuals. A current version of the Plumas County and Plumas National Forest Flora can be provided, upon request.

Task 3-Evaluation of Project Effects

Analyze potential and on-going Project effects from Project facilities, operations, maintenance, and recreation facilities on special-status plant species. The qualitative phase of this assessment will be based on 1) habitat conditions noted in the field (observation of disturbance factors, threats, and adjacent land uses); and 2) a review of the operations and maintenance practices associated with the generation and recreational facilities supplies by the Recreation and Operations and Engineering Work Groups. The quantitative phase of this assessment will be based on any proposed recreation facilities enhancements that are developed by the Recreation Work Group.

6.0 Results

Results

Study results will be summarized in a written report. Results will be prepared to form the basis of a Biological Assessment for the project or inclusion in the EIR/EIS. An interim report will be prepared based on preliminary data that identifies critical environmental areas and first year field studies by August 2002. These critical environmental area designations will include areas containing vernal pools, concentrations of elderberry bushes, bald eagle and peregrine falcon nest territories, and other areas where additional development or habitat disturbance should be avoided. This information will be provided to other work groups as a planning tool. Completed field survey forms will be filed with the CNDDB.

Products/Deliverables

An interim report will be prepared based on preliminary data that identifies critical environmental areas by August 2002. A final report will be completed by January 2004.

7.0 Coordination and Implementation Strategy

Coordination with Other Resource Areas/Studies

This study will require information from other Oroville relicensing studies. Study #EO2 will provide information related to reservoir and afterbay fluctuation models, river hydrology models, projected changes related to future operation, maintenance plans (including pesticide use and levee management practices), and operation of flood detention/relief structures. Study #LU1, Study #LU5, and Study #LU2 will provide information related to current and future land use/mananagement practices or plans including those associated with grazing, fuels, and vegetative management. Information required from the Technical Services Work Group include Geographic Information System layers related to ownership, land use, slope, aspect, elevation, project boundary, project facilities and features, roads, watershed boundaries, and precipitation isobars. Study #RS01 and Study #RS02 will provide information related to type, intensity, and season of current recreational uses. Additional information to be provided Study #RS17 includes future recreational development and recreation related maintenance activities.

This study will also require information from environmental studies, including Study #T2, Study #T3/5, Study #T4, Study #T8, Study #T9, and Study #T10. Information related to projected river erosion rates and bank protection (Study #G2), water temperature (Study #W1), and tributary fisheries (Study #F?).

This study will provide both interim and final reports designating critical environmental areas to the relicensing work groups.

Issues, Concerns, Comments Tracking, and/or Regulatory Compliance

This study plan will analyze project effects on federal and State listed, species of concern, candidate, proposed, and likely threatened, endangered, sensitive, and special interest plant and animal species and the habitat needed to support them. The follow issues were identified during scooping: This study fully or partially addresses the following Stakeholder issues:

Stakeholder issues fully address by SP-T2 Project Effects on Special Status Species

- TE4 Provide suitable bald eagle foraging habitat along the North Fork upstream from Lake Oroville;
- TE7 From January through August limit activities within active Bald Eagle nesting territories;
- TE8 Between November 1 and March 31 limit activities within winter Bald Eagle roost habitat;
- TE11 Encourage species recovery;
- TE12 Develop plans for each Bald Eagle nesting territory; perform habitat improvement projects to enhance bald eagle nesting, roosting or foraging habitat;
- TE13 Have adequate surveys been completed to determine what State or federally listed species (plant and animal) are potentially being impacted by project operations;
- TE15 Inventory and monitor State and federal protected and sensitive plant and wildlife species;
- TE16 Provide habitat leading to viable populations of endangered species;
- TE21 Maintain and enhance the suitability of currently occupied nest territories, and provide sufficient potential nesting, foraging and winter habitat to meet recovery goals of the Pacific States Bald Eagle Recovery Plan;
- TE22 At a minimum, provide habitat sufficient to maintain existing Bald Eagle populations;
- TE25 Maintain viable populations of sensitive plant species. Protect sensitive and special interest plant species, as needed, to maintain viability;
- TE38 Evaluate and mitigate bank swallow habitat impacts (threatened);
- TE45 ESA compliance, want to hear about conflicts with folks and other species (bald eagles);
- TE53 Biological Evaluation of species of concern from BLM and USFS (Plumas and Lassen NF) perspective Surveys should include Region 5 Sensitive plant and animal species as well as Plumas National Forest Special Interest plant species;
- TE56 Adequacy of survey information to document the presence of state or federally listed plant or animal species that are potentially impacted by project operation;
- F13 Project effects on fish species listed for protection under the California and/or federal Endangered Species Acts (ESA), species of special concern, candidate species, proposed, and likely listed threatened and/or endangered fish species, and the habitat needed to support them.

Stakeholder issues partially addressed by SP-T2 Project Effects on Special Status Species

- TE17 Maintain habitat to support viable populations of all native and desired nonnative vertebrate species;
- TE19 Provide diversity of plant and animal communities and tree species by assuring the continuous and viable presence of all stages of all native plant communities on the forest;
- TE20 Provide a diversity of vegetation types and habitat to support viable populations of all fish, wildlife, and plant species;
- TE60 Evaluate effects of proposed increases in recreational activity in Thermalito Afterbay on waterfowl and other wildlife;
- TE62 Protection and sustained conservation of terrestrial wildlife and flora in the project-affected area; comprehensive and well-crafted planning;

Issues

TE19 Provide diversity of plant and animal communities and tree species by assuring the

8.0 Study Schedule

Animals

Tasks 1, 2, 3, 4, 5 7, 8, 9 and 12 completed by August 2003. Tasks,6,9, 10, and 11 completed by December 2003.. Interim report is due August 2002. Final report is due March 2004.

Plants

Task 1 and 2 will be completed by August 2003 and Task 3 by February 2004. An interim report will be completed in September 2002. Final report is due January 2004.

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